Trend Study 19B-7-02

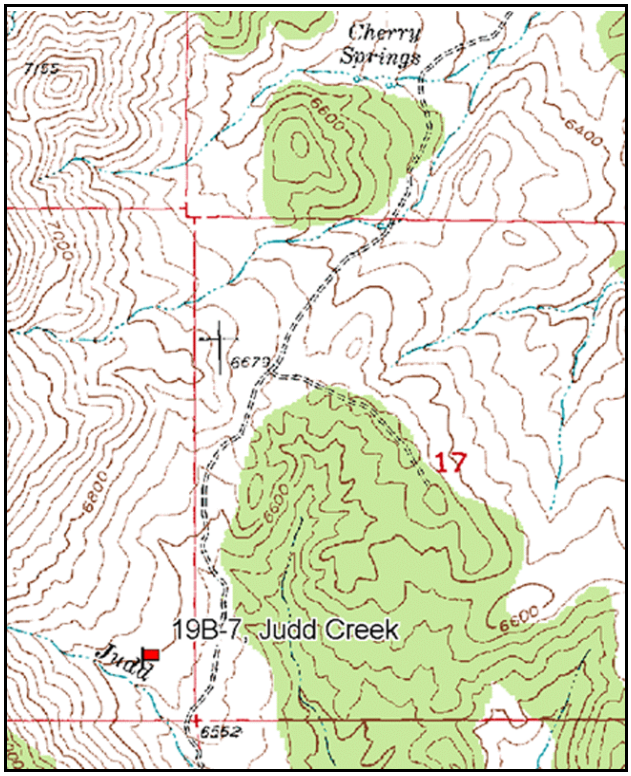
Study site name: Judd Creek . Vegetation type: Mountain Brush .

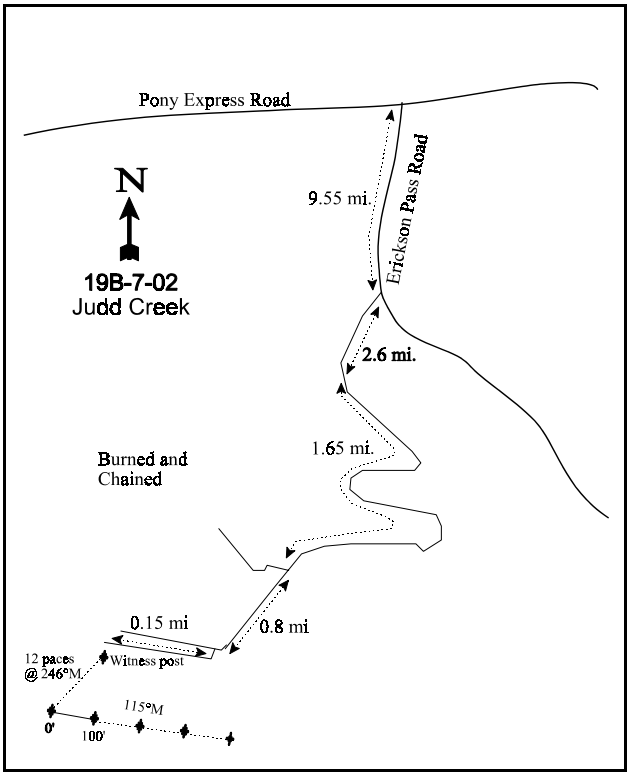
Compass bearing: frequency baseline 115 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Starting at the intersection of the Pony Express and Erickson Pass Roads, proceed south the on Erickson Pass Road for 9.55 miles to an intersection just before where the road crosses Government Creek. Turn right (i.e., southwest) at the intersection and proceed 2.5 miles to an intersection. Stay to the right (i.e., southerly) and proceed 1.9 miles to a green steel "T" fencepost on the west side of the road (next to a Rhus trilobata). From the fencepost, the 0-foot stake of the baseline is 12 paces away at an azimuth of 246 degrees magnetic. The baseline runs at 115 degrees magnetic. The study is marked by green steel "T" fenceposts approximately 12 to 18 inches in height.





Map Name: Indian Springs

Diagrammatic Sketch

Township 10S , Range 7W , Section 18

GPS: NAD 27, UTM 12S 4423215 N 357382 E

DISCUSSION

Judd Creek - Trend Study No. 19B-7

The Judd Creek study is located within a small parcel of private property surrounded by BLM land. The area is categorized as deer winter range, which is also used by cattle during the spring-fall period. The site slopes gently to the south at an elevation of 6,600 feet. The range type is a mixture of Wyoming big sagebrush and antelope bitterbrush with a sparse juniper overstory. Portions of the site were burned in 1996 and then apparently seeded. Lines 2 and 3 of the baseline sample an area that was not burned and the remaining lines are within burned areas. Judd Creek, an intermittent stream, is found several hundred feet south of the baseline. It has a developing willow community associated with it. Use of the site by wildlife is light, but more moderate by livestock. A pellet group transect read on site in 2002 estimated 9 deer days use/acre (23 ddu/ha) and 49 cow days use/acre (120 cdu/ha).

Soils are clay loam in texture and neutral in reactivity (pH of 6.7). Effective rooting depth was estimated at 9 inches in 1997. Average soil temperature was 67°F measured at 12 inches in depth. In 1997, the soil condition was reported as good and erosion was minimal. In 2002 however, bare ground was high and the erosion condition class was determined to be moderate. Litter cover prior to the fire was high at about 60% in 1983 and 1989, but was greatly reduced following fire to less than 30% in 1997 and 2002. Rock and pavement combined, are moderately high on the soil surface. The upper six inches of the profile are also very rocky.

The key browse species are Wyoming big sagebrush and antelope bitterbrush. In 1989, prior to the burn, the estimated density for Wyoming big sagebrush was 1,466 plants/acre, while bitterbrush density was estimated at 2,166 plants/acre. Sagebrush showed moderate use while bitterbrush received moderate to heavy use. Eighty-six percent of the Wyoming big sagebrush population displayed poor vigor in 1989 and percent decadence was high at 61%. The 1989 reading incidentally coincided with a drought period. Density for both species was much lower in the 1997, and also for 2002 which sampled following a fire. Big sagebrush density was estimated at 340 and 260 plants/acre in 1997 and 2002 respectively. Although vigor and decadence both improved between 1989 and 1997 for big sagebrush, both increased to high levels in the 2002 sample, also a drought year. Use was light on big sagebrush in 2002, although annual leader growth averaged 2.2 inches. Bitterbrush density was estimated at 360 and 420 plants/acre in 1997 and 2002 respectively. Use was mostly heavy in 2002, but decadence was low at 14%. Annual leader growth averaged 3.9 inches on bitterbrush. Most of the sagebrush and bitterbrush plants are found in the unburned portion of the transect. A few serviceberry plants (60 plants/acre) are also scattered throughout the site. Serviceberry shows moderate to heavy use, with one-third of the population classified with poor vigor and being decadent in 2002.

Less preferred and/or palatable browse species sampled on this site include Oregon grape, stickyleaf low rabbitbrush, broom snakeweed, Wood's rose, pricklypear cactus, and snowberry. With the exception of broom snakeweed, these species occur in relatively low densities. Snakeweed had an estimated density of 2,000 plants/acre in 2002.

The herbaceous understory was abundant and diverse prior to the burn. Following the fire, perennial grasses and forbs both declined in sum of nested frequency initially (1997). In 2002, sum of nested frequency for perennial grasses increased due to a significant increase in crested wheatgrass which was seeded following the fire. Most other grasses declined in abundance in 2002. Other perennial grasses that have been sampled include intermediate wheatgrass, bluebunch wheatgrass, Indian ricegrass, mutton bluegrass, Kentucky bluegrass, and Sandberg bluegrass. Cheatgrass brome was moderately abundant in 1997, but was not sampled in 2002 with the drought conditions. Grasses had been moderately to heavily utilized when the site was read in 2002.

The forb component had high diversity and was moderately abundant in 1983 and 1989. Even following the burn, perennial forbs only slightly declined in nested frequency, but diversity remained high. With drought and the abundance of Mormon crickets in 2002, the forb component saw drastic reductions in both frequency and diversity. Annual forbs were abundant in 1997, but only one species, knotweed, was sampled in 2002. All forbs combined to provided nearly 15% average cover in 1997, decreasing to 4% in 2002. The most abundant perennial forbs prior to the 2002 reading included wild onion, Louisiana sage, bastard toadflax, longleaf phlox, and American vetch. The only common perennial forbs sampled in 2002 included bastard toadflax and stoneseed.

1983 APPARENT TREND ASSESSMENT

Soil trend appears stable. However, in the event of site disturbance or exceptionally intense storms, the nature of the ground cover and plant composition suggest a potential for increased erosion. Two valuable shrub species, Wyoming big sagebrush and antelope bitterbrush, exhibit relatively stable populations but may be threatened by increasing numbers of undesirable invaders and an apparent increase of the juniper canopy. The herbaceous understory is dominated by low to medium value forbs. These, along with a sparse grass composition, provide minimal ground cover and forage. Overall vegetative trend appears stable.

1989 TREND ASSESSMENT

Protective ground cover characteristics remain almost unchanged. The soil trend is stable, although the dusty surface shows ample evidence of cattle trails and beds. The antelope bitterbrush population is maintaining itself under recent heavy grazing by cattle. However, the Wyoming big sagebrush is not doing as well with 86% of the population showing poor vigor. The browse trend is slightly downward. The herbaceous understory trend is stable. Even though there is a small increase in herbaceous understory sum of nested frequency, many of the species are considered increasers.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - stable (3)

1997 TREND ASSESSMENT

The soil trend is stable with little erosion apparent, even after the wildfire. The fire removed much of the herbaceous understory litter, but there is still adequate ground cover to protect the soil. The browse trend is slightly upward. Although density of the key species decreased after the fire, the Wyoming big sagebrush and bitterbrush populations show improvements in vigor, decadence, and utilization. The populations appear stable at this time, but could increase with the right climatic conditions. Increaser or invader species, primarily broom snakeweed, low rabbitbrush, and Wood's rose, are in low abundance but could also increase under favorable climatic conditions. The herbaceous understory trend is downward with an overall decline in perennial herbaceous understory sum of nested frequency following the fire.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - down (1)

2002 TREND ASSESSMENT

Soils have a downward trend. Several important soil parameters show negative changes since 1997 including increased bare ground, a decrease in cover of litter and herbaceous vegetation, and a decline in the sum of nested frequency value of perennial forbs. The erosion condition class was determined as moderate in 2002. Trend for the key browse species, Wyoming big sagebrush and bitterbrush is slightly down. The big sagebrush population decreased in density, has declining vigor, and has increased decadence. Although bitterbrush slightly increased in density, heavy use was estimated on 71% of the population and poor vigor increased. The herbaceous understory component also has a downward trend. The main positive trend with the understory was the significant increase in crested wheatgrass, which is now the primary grass on the site. However, perennial forbs were the most abundant component of the understory both before the fire as well as one year after the burn in 1997. Sum of nested frequency for perennial forbs declined by 70% in 2002. Downward trends for soils, browse, and herbaceous species are the combination of drought and an abundance of Mormon crickets on the site in 2002. With normal precipitation patterns, most if not all of these trends should improve.

TREND ASSESSMENT
soil - down (1)
browse - slightly down (2)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 19B, Study no: 7

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron cristatum	a-	a-	a1	b131	-	-	1	51	.15	4.61
G	Agropyron intermedium	a-	a-	ab7	b13	-	-	3	5	.09	.12
G	Agropyron smithii	-	-	3	4	-	-	1	1	.03	.03
G	Agropyron spicatum	59	72	85	73	26	28	38	33	3.92	2.80
G	Bromus tectorum (a)	-	-	b186	a-	-	-	69	-	3.39	-
G	Melica bulbosa	-	-	2	-	-	-	1	-	.00	-
G	Oryzopsis hymenoides	b62	b62	a19	a8	30	28	8	4	.12	.09
G	Phleum pratense	-	-	1	-	-	-	1	-	.00	-
G	Poa fendleriana	b38	c95	a13	a3	20	43	6	1	.28	.03
G	Poa pratensis	a-	a-	b19	ab10	-	-	8	4	.16	.04
G	Poa secunda	a12	b47	b57	a13	4	22	20	6	.98	.08
G	Sitanion hystrix	6	9	1	-	4	4	1	-	.00	-
G	Stipa lettermani	-	-	2	-	-	-	1	-	.03	-
Total for Annual Grasses		0	0	186	0	0	0	69	0	3.39	0
Total for Perennial Grasses		177	285	210	255	84	125	89	105	5.79	7.83
Total for Grasses		177	285	396	255	84	125	158	105	9.18	7.83
F	Agoseris glauca	14	-	3	-	5	-	2	-	.06	-
F	Alyssum alyssoides (a)	-	-	b189	a-	-	-	62	-	3.73	-
F	Allium spp.	c122	b28	c105	a-	51	14	38	-	1.12	-
F	Antennaria rosea	-	-	3	-	-	-	1	-	.15	-

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Arabis spp.	-	4	-	-	-	2	-	-	-	-
F	Artemisia ludoviciana	$_{b}$32	$_{b}$23	$_{a}$3	$_{ab}$19	15	13	3	7	.30	.37
F	Aster chilensis	$_{b}$50	$_{b}$52	$_{a}$-	$_{a}$2	21	25	-	2	-	.03
F	Astragalus convallarius	$_{ab}$5	$_{ab}$6	$_{b}$15	$_{a}$1	3	3	6	1	.23	.00
F	Astragalus spp.	$_{a}$-	$_{a}$3	$_{b}$25	$_{a}$-	-	1	12	-	.16	-
F	Astragalus utahensis	-	2	-	-	-	1	-	-	-	-
F	Balsamorhiza sagittata	5	4	9	3	3	2	3	1	.56	.15
F	Castilleja linariaefolia	-	-	1	-	-	-	1	-	.00	-
F	Camelina microcarpa (a)	-	-	$_{b}$21	$_{a}$-	-	-	12	-	.63	-
F	Calochortus nuttallii	$_{b}$12	$_{ab}$8	$_{ab}$8	$_{a}$-	7	3	4	-	.04	-
F	Cirsium spp.	$_{b}$33	$_{ab}$25	$_{a}$10	$_{ab}$16	16	11	5	8	.29	.27
F	Collomia linearis (a)	-	-	$_{b}$17	$_{a}$-	-	-	8	-	.06	-
F	Comandra pallida	$_{a}$33	$_{a}$27	$_{ab}$59	$_{b}$71	18	13	26	30	.99	1.39
F	Collinsia parviflora (a)	-	-	$_{b}$47	$_{a}$-	-	-	18	-	.21	-
F	Crepis acuminata	$_{b}$18	$_{c}$38	$_{b}$11	$_{a}$-	10	22	6	-	.46	-
F	Cryptantha spp.	13	9	9	20	6	5	4	9	.07	.14
F	Delphinium nuttallianum	2	-	-	-	1	-	-	-	-	-
F	Descurainia spp. (a)	-	-	3	-	-	-	1	-	.18	-
F	Eriogonum brevicaule	-	-	-	1	-	-	-	1	-	.00
F	Erodium cicutarium (a)	-	-	1	-	-	-	1	-	.00	-
F	Erigeron spp.	-	-	3	2	-	-	1	1	.03	.00
F	Eriogonum racemosum	-	-	3	-	-	-	1	-	.00	-
F	Galium boreale	-	-	5	-	-	-	2	-	.18	-
F	Hackelia patens	$_{c}$61	$_{b}$22	$_{a}$5	$_{a}$3	30	14	2	2	.01	.04
F	Lathyrus brachycalyx	$_{a}$-	$_{a}$-	$_{b}$25	$_{a}$-	-	-	10	-	.37	-
F	Lactuca serriola	-	-	-	4	-	-	-	2	-	.03
F	Linum lewisii	$_{b}$13	$_{a}$-	$_{a}$3	$_{a}$-	6	-	1	-	.01	-
F	Lithospermum ruderale	17	30	16	18	9	13	8	9	1.32	1.35
F	Lomatium grayi	$_{ab}$4	$_{ab}$5	$_{b}$11	$_{a}$-	2	3	5	-	.05	-
F	Microsteris gracilis (a)	-	-	$_{b}$26	$_{a}$-	-	-	12	-	.08	-
F	Monolepis nuttalliana (a)	3	-	-	-	1	-	-	-	-	-
F	Oenothera spp.	1	-	-	-	1	-	-	-	-	-
F	Penstemon spp.	-	3	-	1	-	1	-	1	-	.00
F	Petradoria pumila	-	2	8	8	-	1	4	5	.24	.24
F	Phlox hoodii	-	-	-	1	-	-	-	1	-	.00
F	Phlox longifolia	$_{b}$54	$_{c}$172	$_{c}$167	$_{a}$1	26	71	68	1	1.27	.00
F	Polygonum douglasii (a)	-	-	$_{b}$14	$_{a}$3	-	-	7	1	.18	.00
F	Ranunculus testiculatus (a)	-	-	$_{b}$36	$_{a}$-	-	-	15	-	.51	-
F	Taraxacum officinale	-	-	7	-	-	-	4	-	.05	-

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Tragopogon dubius	$_{b}$21	$_{a}$-	$_{b}$19	$_{a}$-	11	-	9	-	.47	-
F	Trifolium spp.	-	-	1	-	-	-	1	-	.00	-
F	Unknown forb-perennial	-	1	-	-	-	1	-	-	-	-
F	Veronica biloba (a)	-	-	$_{b}$54	$_{a}$-	-	-	19	-	.21	-
F	Vicia americana	$_{c}$168	$_{c}$188	$_{b}$43	$_{a}$-	68	74	20	-	.59	-
F	Viguiera multiflora	-	-	1	-	-	-	1	-	.00	-
Total for Annual Forbs		3	0	408	3	1	0	155	1	5.82	0.00
Total for Perennial Forbs		678	652	578	171	309	293	248	81	9.09	4.07
Total for Forbs		681	652	986	174	310	293	403	82	14.92	4.07

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 19B, Study no: 7

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Amelanchier utahensis	3	3	.63	.38
B	Artemisia tridentata wyomingensis	10	9	3.13	1.91
B	Cercocarpus montanus	1	0	-	-
B	Chrysothamnus nauseosus albicaulis	0	6	-	.30
B	Chrysothamnus viscidiflorus viscidiflorus	5	12	.18	.78
B	Gutierrezia sarothrae	16	30	.19	.82
B	Juniperus osteosperma	2	5	2.92	4.84
B	Mahonia repens	20	9	.41	.07
B	Opuntia spp.	9	10	.33	.68
B	Purshia tridentata	13	14	2.36	2.50
B	Rosa woodsii	9	11	.26	.42
B	Symphoricarpos oreophilus	3	1	.15	.00
B	Tetradymia canescens	5	6	.03	.04
Total for Browse		96	116	10.61	12.78

CANOPY COVER -- LINE INTERCEPT
Herd unit 19B, Study no: 7

Species	Percent Cover	
	'97	'02
Amelanchier utahensis	-	.50
Artemisia tridentata wyomingensis	-	.75
Chrysothamnus nauseosus albicaulis	-	.05
Chrysothamnus viscidiflorus viscidiflorus	-	.83
Gutierrezia sarothrae	-	.75
Juniperus osteosperma	2	3.58
Opuntia spp.	-	.42
Purshia tridentata	-	1.67
Rosa woodsii	-	.33
Tetradymia canescens	-	.67

Key Browse Annual Leader Growth
Herd unit 19B , Study no: 7

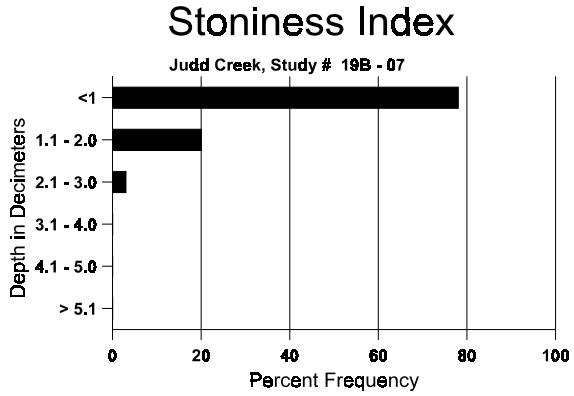
Species	Average leader growth (in)
	'02
Artemisia tridentata wyomingensis	2.2
Purshia tridentata	3.9

BASIC COVER --
Herd unit 19B, Study no: 7

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	329	281	2.25	4.75	34.89	26.16
Rock	246	274	12.50	8.50	8.64	10.54
Pavement	334	338	7.00	9.50	14.81	9.06
Litter	355	355	59.00	60.75	28.76	26.81
Cryptogams	41	1	0	0	.87	.00
Bare Ground	286	323	19.25	16.50	15.31	37.90

SOIL ANALYSIS DATA --
Herd Unit 19B, Study no: 7, Judd Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.1	66.8 (11.9)	6.7	40.4	25.1	34.6	4.9	27.5	611.2	0.8



PELLET GROUP FREQUENCY --
Herd unit 19B, Study no: 7

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'97	'02	'02	'02
Rabbit	5	3	-	-
Deer	11	10	122	9 (23)
Cattle	5	15	583	49 (120)

BROWSE CHARACTERISTICS --
Herd unit 19B, Study no: 7

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	1	-	-	-	-	-	-	-	-	1	-	33	35	35	1
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	1	-	-	-	-	-	1	-	-	-	20	27	35	1
	02	-	-	-	-	-	2	-	-	-	2	-	-	-	40	30	36	2
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	2	-	-	-	-	-	-	2	-	-	-	66			2
	97	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
	02	-	-	-	-	1	-	-	-	-	-	-	-	1	20			1
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	100%	100%	+50%
'89	00%	100%	00%	- 9%
'97	00%	00%	33%	+ 0%
'02	33%	67%	33%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	33	Dec:	0%
	'89	66		100%
	'97	60		33%
	'02	60		33%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	89	2	-	-	-	-	-	-	-	-	1	-	1	-	66			2
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	13	15	-	-	-	-	-	-	-	25	3	-	-	933	25	29	28
	89	8	6	1	-	-	-	-	-	-	1	1	13	-	500	18	25	15
	97	10	1	-	-	-	-	-	-	-	10	-	1	-	220	28	41	11
	02	3	-	-	-	-	-	-	-	-	3	-	-	-	60	20	33	3
D	83	-	7	1	-	-	-	-	-	-	2	5	1	-	266			8
	89	8	18	-	1	-	-	-	-	-	2	1	24	-	900			27
	97	5	-	-	-	-	-	-	-	-	3	-	-	2	100			5
	02	5	-	-	-	1	-	3	-	-	2	-	-	7	180			9
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	58%	03%	03%	+14%
'89	55%	02%	86%	-77%
'97	06%	00%	18%	-24%
'02	08%	00%	54%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	1265	Dec:	21%
	'89	1466		61%
	'97	340		29%
	'02	260		69%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	72	74	0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'83	00%	00%	00%
'89	00%	00%	00%
'97	100%	00%	00%
'02	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	20		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus albicaulis																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	7	-	1	-	-	-	-	-	-	7	-	-	1	160	12	16	8
D	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'83	00%	00%	00%
'89	00%	00%	00%
'97	00%	00%	00%
'02	00%	13%	13%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	66	Dec:	100%
	'89	0		0%
	'97	0		0%
	'02	160		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33	13	28	1
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	11	13	1
	97	8	-	-	-	-	-	-	-	-	8	-	-	-	160	14	19	8
	02	13	1	1	-	-	-	-	-	-	13	-	2	-	300	11	21	15
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	1	-	-	-	-	-	-	-	1	-	1	-	40			2
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+ 0%
'89	00%	00%	00%	+79%
'97	00%	00%	00%	+62%
'02	10%	05%	14%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	33	Dec:	0%
	'89	33		0%
	'97	160		0%
	'02	420		10%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
	02	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
Y	83	12	-	-	-	-	-	-	-	-	12	-	-	-	400			12
	89	10	-	-	4	-	-	-	-	-	14	-	-	-	466			14
	97	18	-	-	-	-	-	-	-	-	18	-	-	-	360			18
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	58	-	-	-	-	-	-	-	-	58	-	-	-	1933	9	7	58
	89	169	-	-	8	-	-	-	-	-	177	-	-	-	5900	8	8	177
	97	39	-	-	-	-	-	-	-	-	39	-	-	-	780	9	5	39
	02	98	-	-	2	-	-	-	-	-	99	-	1	-	2000	11	16	100
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	26	-	-	-	-	-	-	-	-	25	-	1	-	866			26
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+68%
'89	00%	00%	.46%	-84%
'97	00%	00%	00%	+42%
'02	00%	00%	01%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	2333	Dec:	0%
	'89	7232		12%
	'97	1160		2%
	'02	2000		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	83	-	-	-	1	-	-	-	-	-	1	-	-	-	33	67	79	1
	89	-	-	-	1	-	-	-	-	-	1	-	-	-	33	138	118	1
	97	-	-	-	1	-	-	-	-	-	1	-	-	-	20	-	-	1
	02	2	-	-	1	-	-	-	-	-	3	-	-	-	60	-	-	3
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+50%
'89	00%	00%	00%	-70%
'97	00%	00%	00%	+60%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'83	66		-
	'89	133		-
	'97	40		-
	'02	100		-

Mahonia repens																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	4	-	-	13	-	-	-	-	-	17	-	-	-	566			17
	97	17	-	-	-	-	-	-	-	-	17	-	-	-	340			17
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	24	-	-	-	-	-	-	-	-	24	-	-	-	800			24
	89	67	-	-	39	-	-	-	-	-	106	-	-	-	3533			106
	97	21	-	-	-	-	-	-	-	-	21	-	-	-	420			21
	02	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	83	305	-	-	-	-	-	-	-	-	305	-	-	-	10166	4	6	305
	89	297	-	-	200	-	-	-	-	-	497	-	-	-	16566	3	3	497
	97	53	-	-	-	-	-	-	-	-	53	-	-	-	1060	2	4	53
	02	18	-	-	-	-	-	-	-	-	18	-	-	-	360	2	2	18

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+45%
'89	00%	00%	00%	-93%
'97	00%	00%	00%	-72%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'83	10966		-
	'89	20099		-
	'97	1480		-
	'02	420		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
Y	83	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33	4	16	1
	89	9	-	-	-	-	-	-	-	-	8	-	1	-	300	6	8	9
	97	9	-	-	3	-	-	-	-	-	12	-	-	-	240	6	14	12
	02	13	-	-	-	-	-	-	-	-	13	-	-	-	260	8	20	13
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+60%
'89	00%	00%	10%	-16%
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	133	Dec:	0%
	'89	333		0%
	'97	280		7%
	'02	280		7%

Purshia tridentata																		
Y	83	-	1	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	3	3	-	-	-	-	-	-	-	5	-	1	-	200			6
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	02	-	1	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	3	19	-	-	-	-	-	-	22	-	-	-	733	14	36	22
	89	1	20	19	-	1	-	-	-	-	41	-	-	-	1366	15	33	41
	97	12	-	-	-	-	-	-	-	-	12	-	-	-	240	18	54	12
	02	2	3	6	-	-	6	-	-	-	14	-	3	-	340	15	45	17
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	18	-	-	-	-	-	-	-	18	-	-	-	600			18
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	1	-	-	2	-	-	-	3	-	-	-	60			3
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	17%	83%	00%	+65%
'89	65%	29%	02%	-83%
'97	00%	00%	00%	+14%
'02	19%	71%	14%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	766	Dec:	0%
	'89	2166		28%
	'97	360		11%
	'02	420		14%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Rhus trilobata																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	30	48	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	42	60	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'83	00%	00%	00%
'89	00%	00%	00%
'97	00%	00%	00%
'02	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		-
'89	0			-
'97	0			-
'02	0			-

Rosa woodsii																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	32	-	-	-	-	-	-	-	-	32	-	-	-	640			32
	02	81	-	-	-	-	-	-	-	-	81	-	-	-	1620			81
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	10	5	1
	02	29	-	-	-	-	-	-	-	-	29	-	-	-	580	8	9	29
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	10	-	-	-	-	-	-	-	-	4	-	-	6	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'83	00%	00%	00%
'89	00%	00%	00%
'97	00%	00%	00%
'02	00%	00%	05%

%Change

+73%

Total Plants/Acre (excluding Dead & Seedlings)			
'83	0	Dec:	0%
'89	0		0%
'97	660		0%
'02	2400		8%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	1	-	-	-	-	-	1	-	-	-	33			1
	97	1	-	-	2	-	-	-	-	-	3	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33	11	18	1
	89	-	-	-	1	-	-	-	-	-	-	-	1	-	33	13	15	1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	32	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	4	-	-	-	-	-	4	-	-	-	80			4
	02	-	-	-	-	-	-	1	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+50%
'89	00%	00%	50%	+53%
'97	00%	00%	00%	-86%
'02	00%	00%	100%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	33	Dec:	0%
	'89	66		0%
	'97	140		57%
	'02	20		100%

Tetradymia canescens																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	4	-	-	-	-	-	-	-	-	4	-	-	-	133	5	10	4
	89	3	1	-	-	-	-	-	-	-	1	-	3	-	133	7	10	4
	97	6	-	-	-	-	-	-	-	-	6	-	-	-	120	10	7	6
	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100	10	21	5
D	83	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	2	-	-	-	-	-	-	-	-	-	-	2	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	-13%
'89	14%	00%	43%	-31%
'97	00%	00%	00%	-13%
'02	00%	00%	29%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	266	Dec:	38%
	'89	232		14%
	'97	160		0%
	'02	140		29%